

# **US EPA Mid-Continent Ecology Division**

## **Research Project Summary**

### **Methods for Estimating Methylmercury Effects on Avian Species and Extrapolation of Effects Among Species**

#### ***Overview***

This project is part of a larger multi-Divisional project entitled "Methods to estimate risks of multiple stressors, including mercury and habitat alterations, to common loons and other piscivorous bird populations." Although methylmercury toxicity has been studied in several avian species, none of the tests conducted have estimated dose-response relationships and none have been conducted with carnivorous species. This project is conducting controlled pen studies to quantify the relationship between dietary methylmercury exposure, residue accumulation in tissues, and effects on reproductive potential using American kestrels as a surrogate for piscivorous birds that are much more difficult to breed in captivity. Outdoor flight pens with nestboxes are used so kestrels can lay and incubate a clutch of eggs and raise nestlings to fledging. Residue concentrations in tissues throughout the course of treatment will be used to develop a physiologically-based toxicokinetic (PBTk) model in kestrels. This PBTk model, in conjunction with models and toxicity information from other species, will be used to improve estimation of methylmercury toxicity to loons and other piscivorous birds that can not be tested directly. This project is being conducted in conjunction with the USGS Patuxent Wildlife Research Center through funding from NCEA.

#### ***Key Products***

Dose-residue-response relationships of dietary methylmercury on reproduction effects in American kestrels. (anticipated FY05)

Development of a physiologically-based toxicokinetic model for methylmercury in American kestrels. (anticipated FY05)

#### ***For further information on this research contact:***

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